



# TEST REPORT

## FCC ID:2BR65-G27F

**Product** : Portable Google TV  
G27F, G270, G27U, G27\*, G27\*\*\*\*, G270\*\*\*\*, G27F\*\*\*\*,  
G27U\*\*\*\* (\*\* For numbers 0-9 and letters A-Z, a-z,  
**Model Name** : Symbols or blanks represent different appearance colors (of  
the same material) and sales channels, without affecting the  
safety and electromagnetic compatibility performance of the  
**Brand** : N/A  
**Report No.** : NCT25035814E1-3

Prepared for

Shenzhen Shengda Zhilian Technology Co., Ltd

2rd Floor, Building 4, No. 161 Xingye 1st Road, Fenghuang Community, Fuyong Street,  
Bao'an District, Shenzhen, China

Prepared by

Shenzhen NCT Testing Technology Co., Ltd.

A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District,  
Shenzhen, People's Republic of China

TEL: 400-8868-419

## 1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Shengda Zhilian Technology Co., Ltd  
Address : 2nd Floor, Building 4, No. 161 Xingye 1st Road, Fenghuang Community, Fuyong Street, Bao'an District, Shenzhen, China  
Manufacture's name : Shenzhen Shengda Zhilian Technology Co., Ltd  
Address : 2nd Floor, Building 4, No. 161 Xingye 1st Road, Fenghuang Community, Fuyong Street, Bao'an District, Shenzhen, China  
Product name : Portable Google TV  
Model name : G27F, G270, G27U, G27\*, G27\*\*\*\*, G270\*\*\*\*, G27F\*\*\*\*, G27U\*\*\*\* (\*\* For numbers 0-9 and letters A-Z, a-z, Symbols or blanks represent different appearance colors (of the same material) and sales channels, without affecting the safety and electromagnetic compatibility performance of the product)  
Standards : FCC CFR47 Part 15 Section 15.407  
Test procedure : ANSI C63.10:2020  
Test Date : Aug. 27, 2025-Sep. 18, 2025  
Date of Issue : Sep. 18, 2025

This device described above has been tested by NCT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Engineer:



Keven Wu / Engineer

Technical Manager:



Henry Wang / Manager

## Contents

	Page
<b>1 TEST RESULT CERTIFICATION .....</b>	<b>2</b>
<b>2 TEST SUMMARY .....</b>	<b>5</b>
<b>3 TEST FACILITY .....</b>	<b>6</b>
<b>4 GENERAL INFORMATION .....</b>	<b>7</b>
4.1 GENERAL DESCRIPTION OF E.U.T .....	7
4.2 TEST SETUP CONFIGURATION .....	9
4.3 TEST MODE .....	9
<b>5 EQUIPMENT DURING TEST .....</b>	<b>10</b>
5.1 EQUIPMENTS LIST .....	10
5.2 MEASUREMENT UNCERTAINTY .....	12
5.3 DESCRIPTION OF SUPPORT UNITS .....	12
<b>6 CONDUCTED EMISSION .....</b>	<b>13</b>
6.1 E.U.T. OPERATION .....	13
6.2 EUT SETUP .....	13
6.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	14
6.4 MEASUREMENT PROCEDURE: .....	14
6.5 CONDUCTED EMISSION LIMIT .....	14
6.6 MEASUREMENT DESCRIPTION .....	14
6.7 CONDUCTED EMISSION TEST RESULT .....	14
<b>7 RADIATED SPURIOUS EMISSIONS .....</b>	<b>17</b>
7.1 EUT OPERATION .....	17
7.2 TEST SETUP .....	18
7.3 SPECTRUM ANALYZER SETUP .....	19
7.4 TEST PROCEDURE .....	20
7.5 SUMMARY OF TEST RESULTS .....	21
<b>8 POWER SPECTRAL DENSITY TEST .....</b>	<b>30</b>
8.1 TEST STANDARD AND LIMIT .....	30
8.2 TEST SETUP .....	31
8.3 TEST PROCEDURE .....	31

8.4 TEST DATA .....	31
<b>9 26DB &amp; 6DB &amp; 99% EMISSION BANDWIDTH TEST .....</b>	<b>32</b>
9.1 TEST STANDARD .....	32
9.2 TEST SETUP .....	32
9.3 TEST PROCEDURE .....	32
9.4 TEST DATA .....	33
<b>10 MAXIMUM CONDUCTED OUTPUT POWER .....</b>	<b>34</b>
10.1 TEST STANDARD AND LIMIT .....	34
10.2 TEST SETUP .....	34
10.3 TEST PROCEDURE .....	34
10.4 TEST DATA .....	36
<b>11 OUT OF BAND EMISSIONS AND SPURIOUS EMISSION .....</b>	<b>37</b>
11.1 TEST STANDARD AND LIMIT .....	37
11.2 TEST SETUP .....	37
11.3 TEST PROCEDURE .....	37
11.4 TEST DATA .....	38
<b>12 FREQUENCY STABILITY MEASUREMENT .....</b>	<b>39</b>
12.1 TEST STANDARD AND LIMIT .....	39
12.2 TEST SETUP .....	39
12.3 TEST PROCEDURE .....	39
12.4 TEST DATA .....	39
<b>13 ANTENNA REQUIREMENT .....</b>	<b>40</b>
13.1 TEST STANDARD AND REQUIREMENT .....	40
13.2 ANTENNA CONNECTED CONSTRUCTION .....	40
<b>14 TEST SETUP &amp; EUT PHOTOGRAPH .....</b>	<b>41</b>

## 2 Test Summary

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.407(b), 15.209	Radiated Spurious Emission	PASS	
15.207	Conducted Emission	PASS	
15.407 (a) 15.407 (e)	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (a)	Maximum Conducted Output Power	PASS	
15.407(b)	Band Edge	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.407(g)	Frequency Stability	PASS	
15.203	Antenna Requirement	PASS	

Remark:

1. "N/A" denotes test is not applicable in this Test Report.

### 3 TEST FACILITY

#### Site Description

EMC Lab. : Accredited by CNAS, 2022-09-27

The certificate is valid until 2028.01.07

The Laboratory has been assessed and proved to be in compliance with  
CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)

The Certificate Registration Number is L8251

Designation Number: CN1347

Test Firm Registration Number: 894804

Accredited by A2LA, June 14, 2023

The Certificate Registration Number is 6837.01

Accredited by Industry Canada, November 09, 2018

The Conformity Assessment Body Identifier is CN0150

Company Number: 30806

Name of Firm : Shenzhen NCT Testing Technology Co., Ltd.

Site Location : A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District, Shenzhen, People's Republic of China

## 4 General Information

### 4.1 General Description of E.U.T.

Product Name:	Portable Google TV
Model No.:	G27F
Sample ID	20250727A-001#
Sample(s) Status:	Engineer sample
Series Model:	G270, G27U, G27*, G27****, G270****, G27F****, G27U**** (** For numbers 0-9 and letters A-Z, a-z, Symbols or blanks represent different appearance colors (of the same material) and sales channels, without affecting the safety and electromagnetic compatibility performance of the product)
Model Different.:	All the same except the model number and color.
Operation Frequency:	WIFI 5.2G: 5150MHz~5250MHz WIFI 5.8G: 5725MHz~5850MHz
Modulation type:	802.11a(OFDM): BPSK,QPSK,16QAM,64QAM 802.11n(OFDM): BPSK,QPSK,16QAM,64QAM 802.11ac(OFDMA): BPSK,QPSK,16QAM,64QAM,256QAM
Antenna Type:	Internal Antenna
Antenna gain:	2.74 dBi @5150MHz~5250MHz, 2.58 dBi @5725MHz~5850MHz
Power supply	DC 14.8V from battery; Charging input: DC 19V
Hardware Version:	N/A
Software Version:	N/A
Channel Puncturing Function:	<input type="checkbox"/> Supported <input type="checkbox"/> Unspported
Support RU:	<input type="checkbox"/> Full RU <input type="checkbox"/> Partial RU
Remark:	the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.

802.11a/ac/n( 20MHz) Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	44	5220	48	5240

802.11ac/n(40MHz) Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230	-	-	-	-
802.11ac(80MHz) Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	-	-	-	-	-	-

802.11a/ac/n( 20 MHz) Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

802.11ac/n(40MHz) Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-
802.11ac(80MHz) Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775	-	-	-	-

## 4.2 Test Setup Configuration

Conducted Emission

Radiated Emission



Radiated Spurious



Conducted Emission



Conducted Spurious



## 4.3 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
-------------------	---

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

Test Software	The EUT enters engineering mode
Power level setup	10

## 5 Equipment During Test

### 5.1 Equipments List

Conducted emission Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	944 Room	/	EMToni	2025/1/17	2028/1/16
EMI Test Receiver	ESPI	101604	Rohde & Schwarz	2025/6/10	2026/6/09
limitator	ESH3-Z2	NA	Ronde&Schwarz	2025/6/10	2026/6/09
Attenuation	PCL-10dB	221126	HTEC	2025/6/10	2026/6/09
LISN	ENV 216	102796	Rohde & Schwarz	2025/6/10	2026/6/09
LISN	VN1-13S	004023	CRANAGE	2025/6/10	2026/6/09
Cable	RG223-1500MM	NA	RG	2025/6/10	2026/6/09

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2025/1/17	2028/1/16
EMI Test Receiver	ESCI	101178	Rohde & Schwarz	2025/6/10	2026/6/09
Amplifi (30MHz-1GHz)	BBV 9743 B	00374	SCHNWARZBECK	2025/6/10	2026/6/09
Power Meter	ML2495A	10084	Anritu	2025/6/10	2026/6/09
Bilog Antenna (30MHz-1GHz)	VULB9162	00473	SCHNWARZBECK	2025/3/08	2026/3/07
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHNWARZBECK	2025/3/10	2026/3/09
Pream plifier (1GHz-18GHz)	BBV 9718D	0024	SCHNWARZBECK	2025/6/10	2026/6/09
Spectrum Analyze (10Hz-40GHz)	FSV 40	100952	Rohde & Schwarz	2025/6/10	2026/6/09
Pream plifier (18GHz-40GHz)	BBV 9721	0056	SCHNWARZBECK	2025/6/10	2026/6/09
Double Ridge Guide Horn Antenna (18GHz-40GHz)	SAS-574	588	A.H.System	2025/3/10	2026/3/09

Loop Antenna (9KHz-30MHz)	FMZB1519B	014	SCHNWARZBECK	2025/6/10	2026/6/09
Comprehensive tester	CWM500	104995	Rohde & Schwarz	2025/6/10	2026/6/09
Amplifier (9KHz-30MHz)	BBV 9745	00109	CHNWARZBECK	2025/6/10	2026/6/09
MXG Signal Analyzer	N9020A	MY50510202	Agilent	2025/6/10	2026/6/09
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2025/6/10	2026/6/09
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2025/6/10	2026/6/09
Power Sensor	TR1029-2	512364	Techoy	2025/6/10	2026/6/09
constant temperature and humidity chamber	OJN-9606	/	Zhongheng	2025/2/18	2026/2/17
RF Swith	TR1029-1	512364	Techoy	2025/6/10	2026/6/09
Cable	DA800-4000MM	NA	DA	2025/6/10	2026/6/09
Cable	DA800-11000MM	NA	DA	2025/6/10	2026/6/09

#### Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ-EMC	Ver.EMC-CON 3A1.1+
2	EMC radiation test system	FALA	EZ-EMC	Ver.FA-03A2 RE+
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

## 5.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	$\pm 1.0\text{dB}$
Power Spectral Density, conducted	$\pm 2.2\text{dB}$
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conducted Emissions (150kHz~30MHz)	$\pm 3.64\text{dB}$
Radiated Emission(9KHz~30MHz)	$\pm 4.51\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 4.74\text{dB}$
Radiated Emission(25GHz~40GHz)	$\pm 3.38\text{dB}$
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

## 5.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Portable Google TV	N/A	G27F	N/A	EUT
E-1	Adater		FX65C-190342Z	N/A	Auxiliary

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 6 Conducted Emission

Test Requirement: : FCC CFR 47 Part 15 Section 15.207  
Test Method: : ANSI C63.10:2020  
Test Result: : PASS  
Frequency Range: : 150kHz to 30MHz  
Class/Severity: : Class B  
Detector: : Peak for pre-scan (9kHz Resolution Bandwidth)

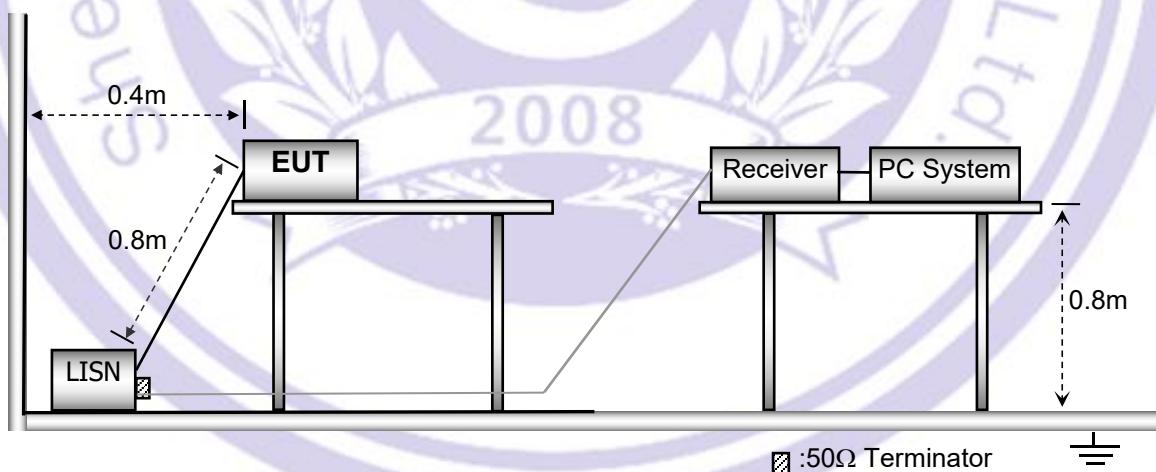
### 6.1 E.U.T. Operation

Operating Environment :

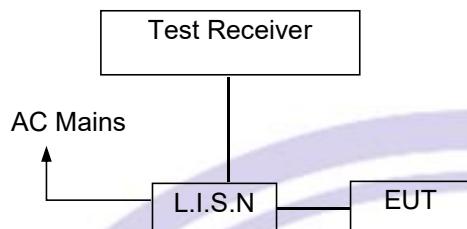
Temperature: : 23.2°C  
Humidity: : 51 % RH  
Atmospheric Pressure: : 101.12 kPa  
Test Voltage : AC 120V/60Hz

### 6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10: 2020



### 6.3 Test SET-UP (Block Diagram of Configuration)



### 6.4 Measurement Procedure:

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

### 6.5 Conducted Emission Limit

#### Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

#### Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 6.6 Measurement Description

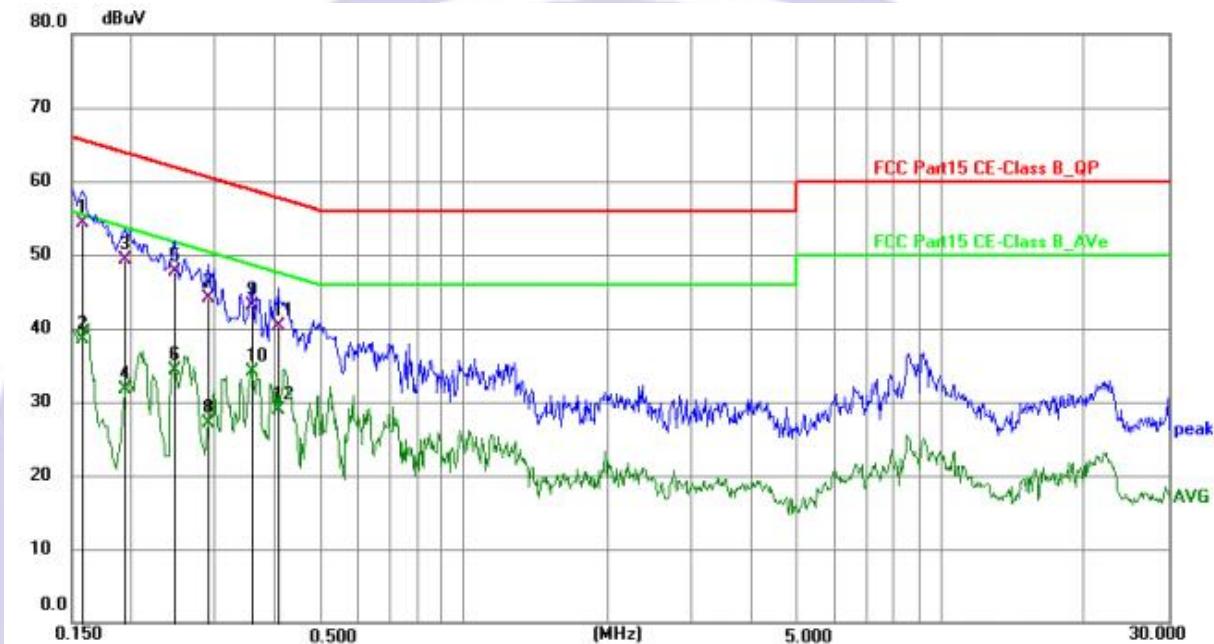
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

### 6.7 Conducted Emission Test Result

Pass

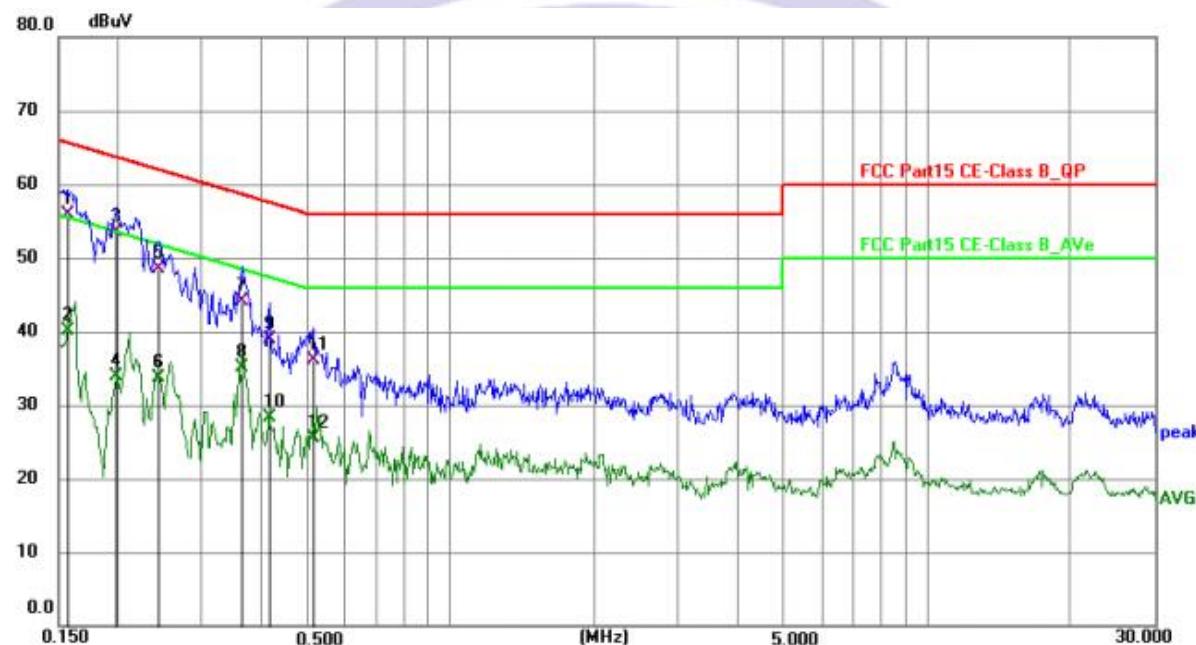
Conducted emission at both 120V & 240V is assessed, and emission at 120V represents the worst case. All the modulation modes were tested the data of the worst mode (802.11a, Lowest channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Temperature:	23.2°C	Relative Humidity:	51%
Pressure:	101.12kPa	Phase :	L
Test Voltage :	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.1580	34.74	19.49	54.23	65.57	-11.34	QP
2	0.1580	18.92	19.49	38.41	55.57	-17.16	AVG
3	0.1932	29.72	19.50	49.22	63.90	-14.68	QP
4	0.1932	12.13	19.50	31.63	53.90	-22.27	AVG
5	0.2460	28.19	19.49	47.68	61.89	-14.21	QP
6	0.2460	14.81	19.49	34.30	51.89	-17.59	AVG
7	0.2900	24.59	19.49	44.08	60.52	-16.44	QP
8	0.2900	7.71	19.49	27.20	50.52	-23.32	AVG
9	0.3573	23.52	19.49	43.01	58.79	-15.78	QP
10	0.3573	14.61	19.49	34.10	48.79	-14.69	AVG
11	0.4060	20.79	19.49	40.28	57.73	-17.45	QP
12	0.4060	9.50	19.49	28.99	47.73	-18.74	AVG

Temperature:	23.2°C	Relative Humidity:	51%
Pressure:	101.12kPa	Phase :	N
Test Voltage :	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.1564	36.36	19.49	55.85	65.65	-9.80	QP
2	0.1564	20.54	19.49	40.03	55.65	-15.62	AVG
3	0.1980	33.96	19.49	53.45	63.69	-10.24	QP
4	0.1980	14.38	19.49	33.87	53.69	-19.82	AVG
5	0.2420	29.04	19.48	48.52	62.03	-13.51	QP
6	0.2420	14.20	19.48	33.68	52.03	-18.35	AVG
7	0.3620	24.65	19.48	44.13	58.68	-14.55	QP
8	0.3620	15.72	19.48	35.20	48.68	-13.48	AVG
9	0.4140	19.48	19.49	38.97	57.57	-18.60	QP
10	0.4140	8.91	19.49	28.40	47.57	-19.17	AVG
11	0.5140	16.67	19.49	36.16	56.00	-19.84	QP
12	0.5140	5.93	19.49	25.42	46.00	-20.58	AVG

Notes:

- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Measurement Level = Reading level + Correct Factor

## 7 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.407

Test Method : ANSI C63.10:2020

Test Result : PASS

Measurement Distance : 3m

Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	20log <sup>(2400/F(kHz))</sup> + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	20log <sup>(24000/F(kHz))</sup> + 40
1.705 ~ 30	30	30	100 * 30	20log <sup>(30)</sup> + 40
30 ~ 88	100	3	100	20log <sup>(100)</sup>
88 ~ 216	150	3	150	20log <sup>(150)</sup>
216 ~ 960	200	3	200	20log <sup>(200)</sup>
Above 960	500	3	500	20log <sup>(500)</sup>

### 7.1 EUT Operation

Operating Environment :

Temperature : 24.5 °C

Humidity : 55.5% RH

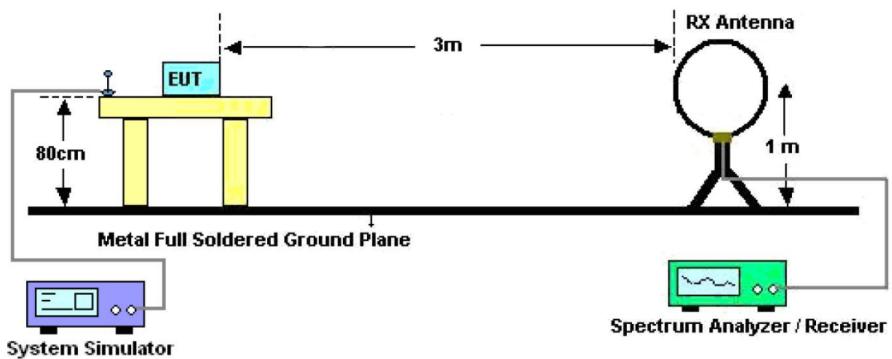
Atmospheric Pressure : 101.3kPa

Test Voltage : AC 120V60Hz

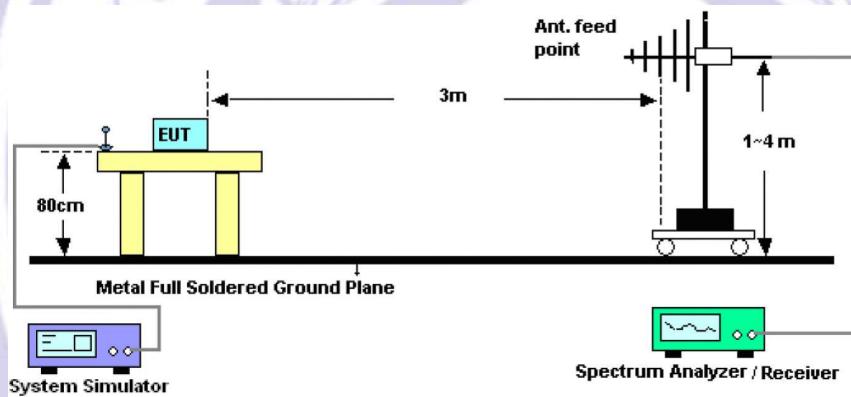
## 7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

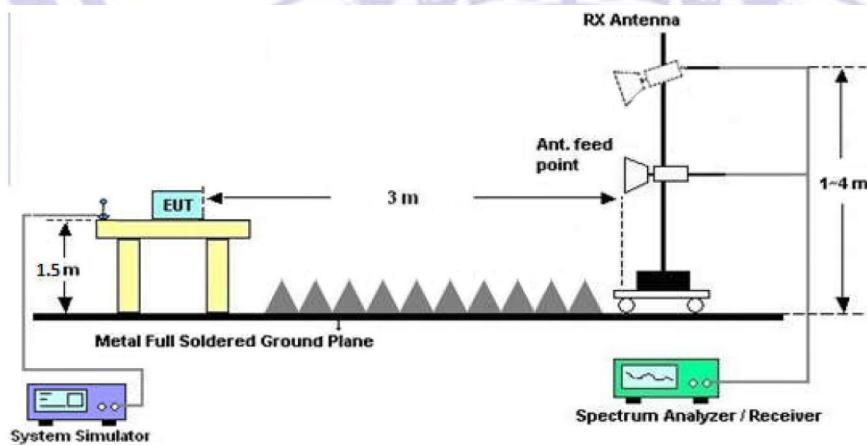
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



### 7.3 Spectrum Analyzer Setup

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

## 7.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2020.
2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
7. Test Procedure of measurement (For Above 1GHz):
  - 1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
  - 2) Change the antenna polarization and repeat 1) with vertical polarization.
  - 3) Make a hardcopy of the spectrum.
  - 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
  - 5) Change the analyser mode to Clear/ Write and found the cone of emission.
  - 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
  - 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
  - 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

## 7.5 Summary of Test Results

### Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

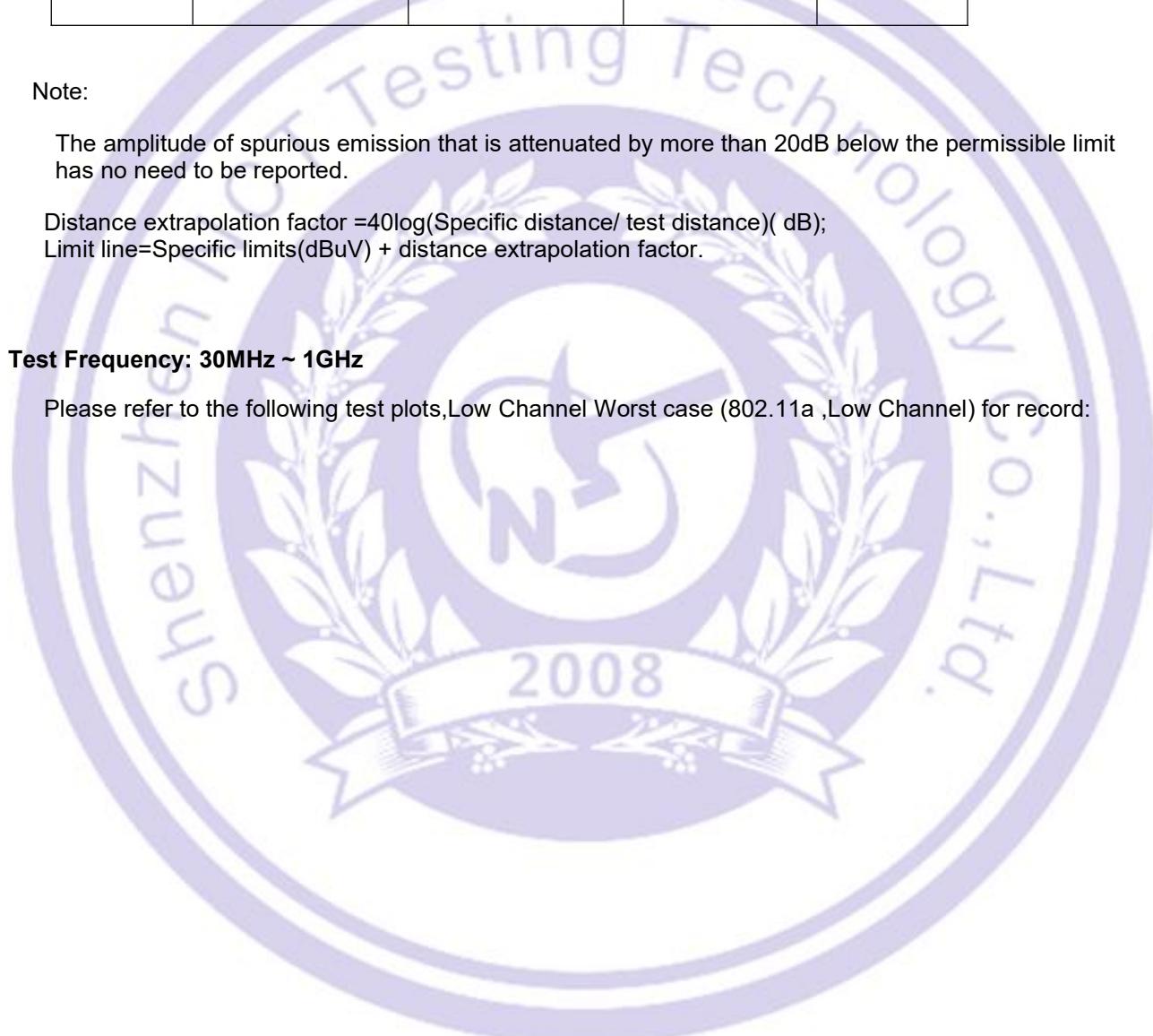
Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40\log(\text{Specific distance} / \text{test distance})$ ( dB);  
Limit line=Specific limits(dBuV) + distance extrapolation factor.

### Test Frequency: 30MHz ~ 1GHz

Please refer to the following test plots,Low Channel Worst case (802.11a ,Low Channel) for record:



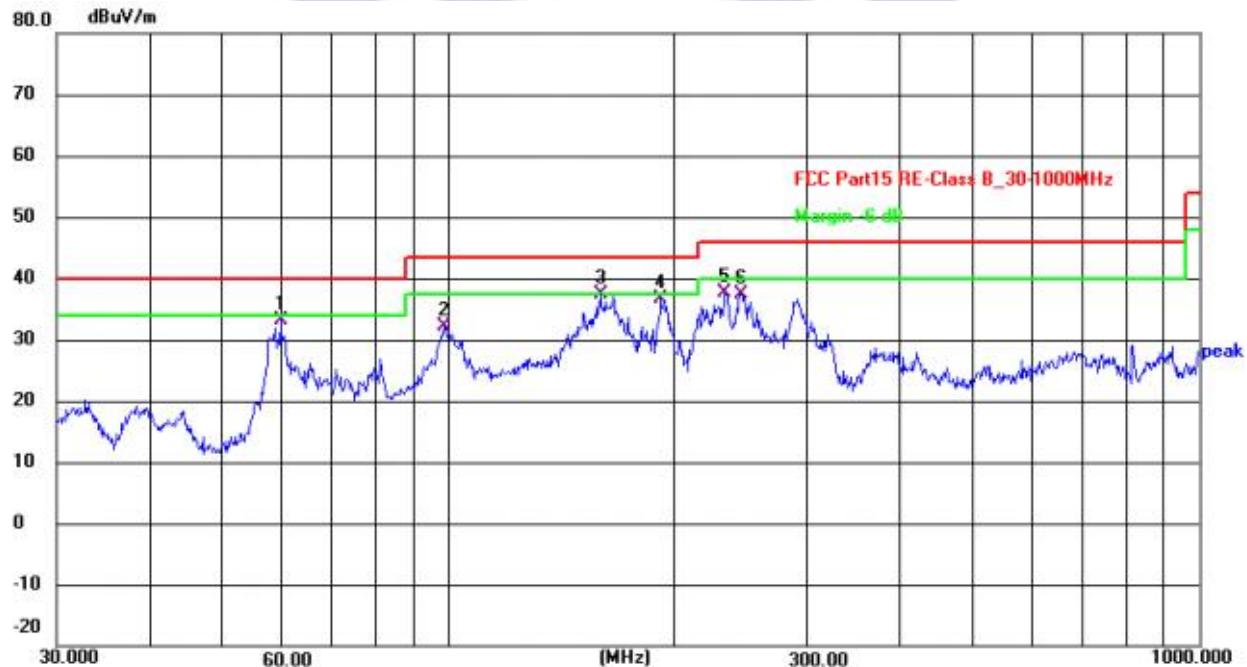
Temperature:	24.5°C	Relative Humidity:	55.5%
Pressure:	101.3kPa	Polarization:	Vertical
Test Voltage:	DC 14.8V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	57.5940	48.95	-14.82	34.13	40.00	-5.87	QP
2	80.9274	52.62	-19.91	32.71	40.00	-7.29	QP
3	99.5279	53.92	-16.00	37.92	43.50	-5.58	QP
4	158.1123	56.16	-18.73	37.43	43.50	-6.07	QP
5	215.2675	52.40	-15.82	36.58	43.50	-6.92	QP
6	244.2321	55.18	-15.04	40.14	46.00	-5.86	QP

Remark: Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Temperature:	24.5°C	Relative Humidity:	55.5%
Pressure:	101.3 kPa	Polarization:	Horizontal
Test Voltage:	DC 14.8V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	59.6492	48.08	-14.99	33.09	40.00	-6.91	QP
2	98.4865	48.39	-16.25	32.14	43.50	-11.36	QP
3	159.2250	56.04	-18.65	37.39	43.50	-6.11	QP
4	191.7450	53.41	-16.79	36.62	43.50	-6.88	QP
5	233.3486	52.81	-15.27	37.54	46.00	-8.46	QP
6	245.0900	52.35	-15.03	37.32	46.00	-8.68	QP

Remark: Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

**Test Frequency 1GHz-40GHz**

802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detec- or Type
Low Channel:5745MHz									
V	11490	45.94	32.29	8.39	38.90	60.94	74.00	-13.06	PK
V	11490	27.53	32.29	8.39	38.90	42.53	54.00	-11.47	AV
V	17233.3	42.12	31.19	9.62	40.37	60.92	74.00	-13.08	PK
V	17233.3	22.86	31.19	9.62	40.37	41.66	54.00	-12.34	AV
V	22980	39.88	27.02	7.20	38.98	59.04	74.00	-14.96	PK
V	22980	23.34	27.02	7.20	38.98	42.50	54.00	-11.50	AV
V	28723.3	43.5	27.10	7.56	40.18	64.14	74.00	-9.86	PK
V	28723.3	20.24	27.10	7.56	40.18	40.88	54.00	-13.12	AV
H	11490	48.46	32.29	8.39	38.90	63.46	74.00	-10.54	PK
H	11490	27.67	32.29	8.39	38.90	42.67	54.00	-11.33	AV
H	17233.3	44.55	31.19	9.62	40.37	63.35	74.00	-10.65	PK
H	17233.3	24.91	31.19	9.62	40.37	43.71	54.00	-10.29	AV
H	22980	40.82	27.02	7.20	38.98	59.98	74.00	-14.02	PK
H	22980	20.88	27.02	7.20	38.98	40.04	54.00	-13.96	AV
H	28723.3	40.6	27.10	7.56	40.18	61.24	74.00	-12.76	PK
H	28723.3	20.27	27.10	7.56	40.18	40.91	54.00	-13.09	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Middle Channel:5785MHz									
V	11570	43.63	32.26	8.48	38.90	58.75	74.00	-15.25	PK
V	11570	22.52	32.26	8.48	38.90	37.64	54.00	-16.36	AV
V	17353.3	36.93	31.08	9.67	40.61	56.13	74.00	-17.87	PK
V	17353.3	20.69	31.08	9.67	40.61	39.89	54.00	-14.11	AV
V	23140	39.43	27.03	7.24	39.03	58.67	74.00	-15.33	PK
V	23140	20.89	27.03	7.24	39.03	40.13	54.00	-13.87	AV
V	28923.3	40.34	27.10	7.58	40.34	61.16	74.00	-12.84	PK
V	28923.3	20.84	27.10	7.58	40.34	41.66	54.00	-12.34	AV
H	11570	43.31	32.26	8.48	38.90	58.43	74.00	-15.57	PK
H	11570	23.33	32.26	8.48	38.90	38.45	54.00	-15.55	AV
H	17353.3	39.79	31.08	9.67	40.61	58.99	74.00	-15.01	PK
H	17353.3	21.08	31.08	9.67	40.61	40.28	54.00	-13.72	AV
H	23140	36.99	27.03	7.24	39.03	56.23	74.00	-17.77	PK
H	23140	17.33	27.03	7.24	39.03	36.57	54.00	-17.43	AV
H	28923.3	38.11	27.10	7.58	40.34	58.93	74.00	-15.07	PK
H	28923.3	17.31	27.10	7.58	40.34	38.13	54.00	-15.87	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
High Channel:5825MHz									
V	11650	43.03	32.23	8.56	38.90	58.26	74.00	-15.74	PK
V	11650	26.75	32.23	8.56	38.90	41.98	54.00	-12.02	AV
V	17473.3	42.22	30.97	9.73	40.85	61.83	74.00	-12.17	PK
V	17473.3	25.85	30.97	9.73	40.85	45.46	54.00	-8.54	AV
V	23300	39.25	27.03	7.26	39.06	58.54	74.00	-15.46	PK
V	23300	23.47	27.03	7.26	39.06	42.76	54.00	-11.24	AV
V	29123.3	37.72	27.10	7.61	40.40	58.63	74.00	-15.37	PK
V	29123.3	24.21	27.10	7.61	40.40	45.12	54.00	-8.88	AV
H	11650	45.86	32.23	8.56	38.90	61.09	74.00	-12.91	PK
H	11650	28.77	32.23	8.56	38.90	44.00	54.00	-10.00	AV
H	17473.3	40.41	30.97	9.73	40.85	60.02	74.00	-13.98	PK
H	17473.3	27.9	30.97	9.73	40.85	47.51	54.00	-6.49	AV
H	23300	45.42	27.03	7.26	39.06	64.71	74.00	-9.29	PK
H	23300	21.83	27.03	7.26	39.06	41.12	54.00	-12.88	AV
H	29123.3	34.84	27.10	7.61	40.40	55.75	74.00	-18.25	PK
H	29123.3	23.9	27.10	7.61	40.40	44.81	54.00	-9.19	AV

802.11a

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Low Channel:5180MHz									
V	10360	42.19	32.70	7.72	38.59	55.8	74	-18.2	PK
V	10360	23.73	32.70	7.72	38.59	37.34	54	-16.66	AV
V	15540	46.49	31.74	9.44	39.29	63.48	74	-10.52	PK
V	15540	19.96	31.74	9.44	39.29	36.95	54	-17.05	AV
V	20720	40.26	26.93	6.64	37.94	57.91	74	-16.09	PK
V	20720	14.36	26.93	6.64	37.94	32.01	54	-21.99	AV
V	25900	37.85	27.10	7.90	39.32	57.97	74	-16.03	PK
V	25900	20.19	27.10	7.90	39.32	40.31	54	-13.69	AV
H	10360	37.7	32.70	7.72	38.59	51.31	74	-22.69	PK
H	10360	23.09	32.70	7.72	38.59	36.7	54	-17.3	AV
H	15540	37.25	31.74	9.44	39.29	54.24	74	-19.76	PK
H	15540	19.66	31.74	9.44	39.29	36.65	54	-17.35	AV
H	20720	42.29	26.93	6.64	37.94	59.94	74	-14.06	PK
H	20720	16.81	26.93	6.64	37.94	34.46	54	-19.54	AV
H	25900	37.85	27.10	7.90	39.32	57.97	74	-16.03	PK
H	25900	21.51	27.10	7.90	39.32	41.63	54	-12.37	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Middle Channel:5200MHz									
V	10400	40.39	32.69	7.73	38.62	54.05	74	-19.95	PK
V	10400	24.46	32.69	7.73	38.62	38.12	54	-15.88	AV
V	15600	40.27	31.72	9.45	39.28	57.28	74	-16.72	PK
V	15600	19.89	31.72	9.45	39.28	36.9	54	-17.1	AV
V	20800	39.17	26.93	6.73	37.96	56.93	74	-17.07	PK
V	20800	19.2	26.93	6.73	37.96	36.96	54	-17.04	AV
V	26000	36.24	27.10	7.94	39.30	56.38	74	-17.62	PK
V	26000	14.14	27.10	7.94	39.30	34.28	54	-19.72	AV
H	10400	42.36	32.69	7.73	38.62	56.02	74	-17.98	PK
H	10400	21.15	32.69	7.73	38.62	34.81	54	-19.19	AV
H	15600	40.71	31.72	9.45	39.28	57.72	74	-16.28	PK
H	15600	19.72	31.72	9.45	39.28	36.73	54	-17.27	AV
H	20800	41.37	26.93	6.73	37.96	59.13	74	-14.87	PK
H	20800	19.22	26.93	6.73	37.96	36.98	54	-17.02	AV
H	26000	37.02	27.10	7.94	39.30	57.16	74	-16.84	PK
H	26000	18.07	27.10	7.94	39.30	38.21	54	-15.79	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
High Channel:5240MHz									
V	10480	43.93	32.66	7.74	38.68	57.69	74	-16.31	PK
V	10480	22.92	32.66	7.74	38.68	36.68	54	-17.32	AV
V	15720	40.87	31.68	9.48	39.26	57.93	74	-16.07	PK
V	15720	17.16	31.68	9.48	39.26	34.22	54	-19.78	AV
V	20960	38.53	26.94	6.91	37.99	56.49	74	-17.51	PK
V	20960	21.51	26.94	6.91	37.99	39.47	54	-14.53	AV
V	26200	36.45	27.10	7.89	39.50	56.74	74	-17.26	PK
V	26200	17.76	27.10	7.89	39.50	38.05	54	-15.95	AV
H	10480	44.33	32.66	7.74	38.68	58.09	74	-15.91	PK
H	10480	21.05	32.66	7.74	38.68	34.81	54	-19.19	AV
H	15720	40.47	31.68	9.48	39.26	57.53	74	-16.47	PK
H	15720	21.18	31.68	9.48	39.26	38.24	54	-15.76	AV
H	20960	37.01	26.94	6.91	37.99	54.97	74	-19.03	PK
H	20960	20.54	26.94	6.91	37.99	38.5	54	-15.5	AV
H	26200	35.65	27.10	7.89	39.50	55.94	74	-18.06	PK
H	26200	15.69	27.10	7.89	39.50	35.98	54	-18.02	AV

**Remark:**

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss - Pre-amplifier,  
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4. The worst mode is 802.11a, only the worst data is recorded.

## 8 POWER SPECTRAL DENSITY TEST

### 8.1 Test Standard and Limit

#### According to FCC §15.407(3)

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum

power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

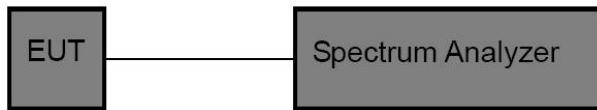
(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi

without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

## 8.2 Test Setup



## 8.3 Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above,

2. Spectrum Setting:

RBW > the 20 dB bandwidth of the emission being measured

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

## 8.4 Test Data

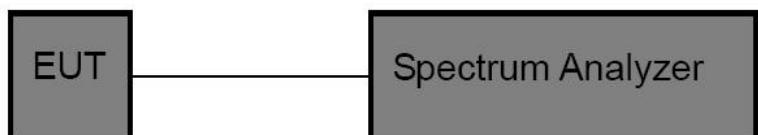
Please see the attachment for the data.

## 9 26DB & 6DB & 99% Emission Bandwidth Test

### 9.1 Test Standard

Test Standard	FCC Part15 C Section 15.407
	<p>The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.</p>

### 9.2 Test Setup



### 9.3 Test Procedure

- a) Set RBW = 1000KHz.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 3.3 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot \text{RBW}$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

#### 9.4 Test Data

Please see the attachment for the data.

## 10 Maximum Conducted Output Power

### 10.1 Test Standard and Limit

According to FCC §15.407

For an outdoor access point operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For the band 5.725–5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

### 10.2 Test Setup



### 10.3 Test Procedure

The EUT was directly connected to the Power meter

#### 1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

## 2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.<sup>1</sup> However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle  $\geq$  98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than  $\pm$  2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep):

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

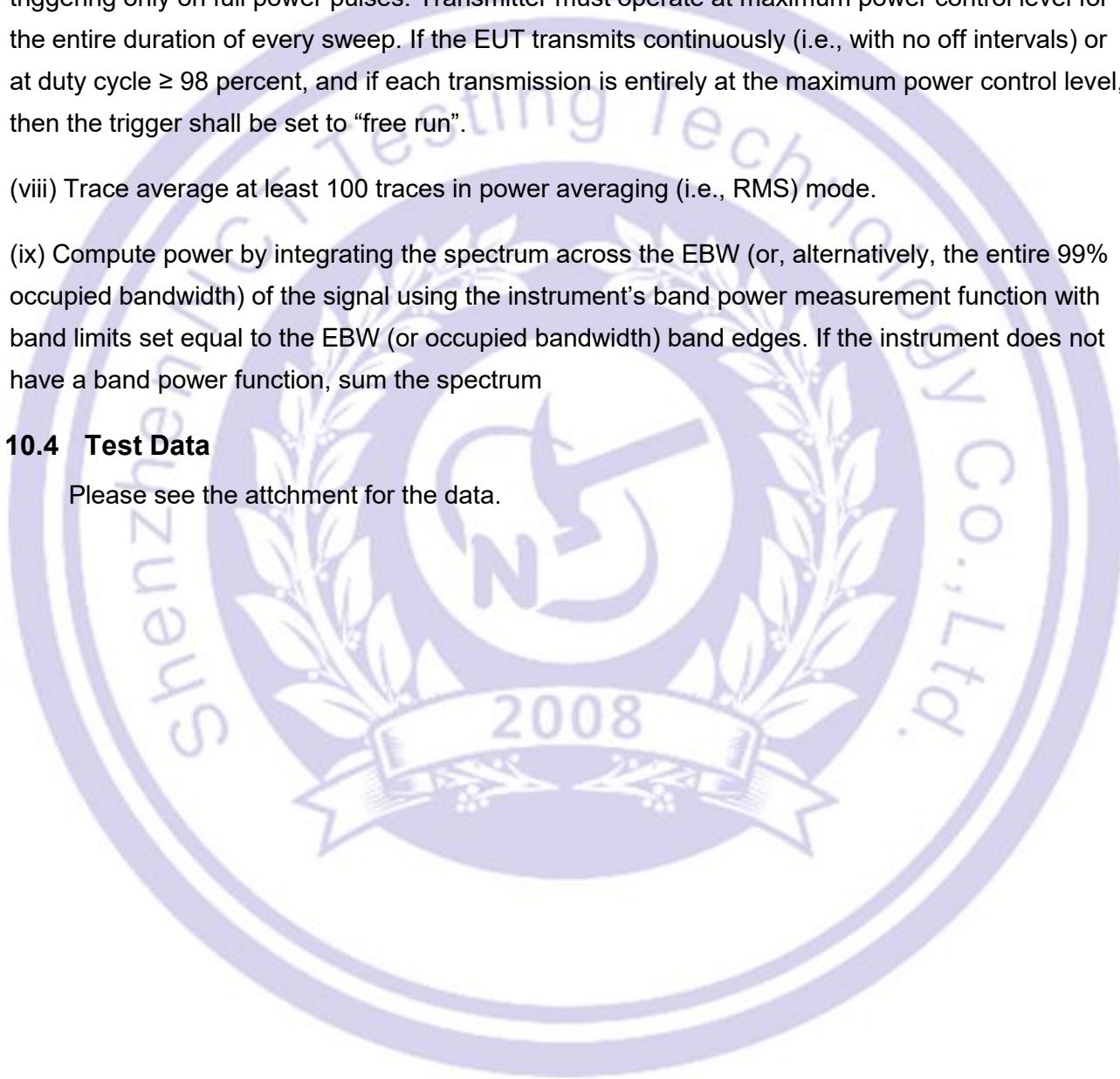
(iii) Set VBW  $\geq$  3 MHz.

(iv) Number of points in sweep  $\geq$  2 Span / RBW. (This ensures that bin-to-bin spacing is  $\leq$  RBW/2, so that narrowband signals are not lost between frequency bins.)

- (v) Sweep time = auto.
- (vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- (vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle  $\geq$  98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
- (viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

#### **10.4 Test Data**

Please see the attachment for the data.



## 11 Out of Band Emissions and Spurious Emission

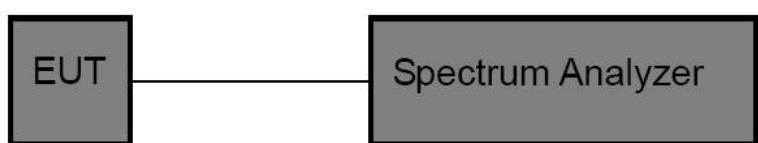
### 11.1 Test Standard and Limit

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

### 11.2 Test Setup



### 11.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

#### 11.4 Test Data

Please see the attachment for the data.



## 12 Frequency Stability Measurement

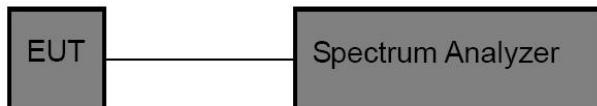
### 12.1 Test Standard and Limit

FCC

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be  $\pm 20$  ppm maximum for the 5 GHz band (IEEE 802.11n specification).

### 12.2 Test Setup



### 12.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is  $(fc-f)/fc \times 106$  ppm and the limit is less than  $\pm 20$  ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is  $-20^{\circ}\text{C} \sim 50^{\circ}\text{C}$ .

### 12.4 Test Data

Please see the attachment for the data.

## 13 Antenna Requirement

### 13.1 Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	<p>1) 15.203 requirement:</p> <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p>

### 13.2 Antenna Connected Construction

The antenna is Internal antenna, the Max gain of the antennas is 2.74 dBi @5150MHz~5250MHz, 2.58 dBi @5725MHz~5850MHz, reference to the attachment for details.

## 14 TEST SETUP & EUT PHOTOGRAPH

Please see the attachment for details.

----- End of Report -----

